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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/596,313

06/08/2006

Klaus Doelle

P29768

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7055 7590 02/25/2008
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EXAMINER

CALANDRA, ANTHONY J

ART UNIT

PAPER NUMBER

1791

NOTIFICATION DATE

DELIVERY MODE

02/25/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/596,313	Applicant(s) DOELLE, KLAUS	
	Examiner ANTHONY J. CALANDRA	Art Unit 4128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 September 2007 and 8 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 23-47 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 23-47 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9/28/07</u> . | 6) <input type="checkbox"/> Other: _____ |

Detailed Office Action

1. The communications dated 6/8/06 and 9/28/07 have been entered and fully considered.
2. Claims 1-22 have been canceled. Claims 23-46 are currently pending.

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Method and Arrangement for Charging a Fiber Suspension with Calcium Carbonate.

Double Patenting

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 23-47 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 19-45 of copending Application No.

10/566046 as evidenced by *Calcium Carbonate agglomeration and form during precipitation*

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from solution by JONES et al., in view of Handbook for Pulp and Paper Technologists by SMOOK, hereinafter SMOOK. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of both applications claim loading fibers with calcium carbonate by adding calcium hydroxide or calcium carbonate to the fiber suspension and then introducing carbon dioxide.

As for claim 23, the copending application claims a method for loading fibers with calcium carbonate by adding calcium oxide or calcium hydroxide in a dry or aqueous form (*A method for loading a fibrous suspension containing cellulose fibers with calcium carbonate, comprising: introducing one of aqueous calcium hydroxide, dry calcium hydroxide and calcium oxide into the fibrous suspension* [see e.g. claim 19]). The copending application further claims introducing carbon dioxide to precipitate out the calcium carbonate (*introducing gaseous carbon dioxide into the fibrous suspension; and precipitating the calcium carbonate in spherical agglomerations of crystals by the carbon dioxide* [see e.g. claim 19]).

As for claim 44, the copending application discloses an apparatus for loading fibers with calcium carbonate which includes a static mixer and a disperger or a refiner (*A device for loading a fibrous suspension containing cellulose fibers with calcium carbonate, comprising: a reactor for performing a precipitation process, wherein the reactor is at least one of: a mixing device; a crystallizer reactor; a refiner; a disperger; and a fluffer FLPCC reactor* [see e.g. claim 45])

The copending application claims do not claim spherical agglomerations are formed, however this is an inherent property of calcium carbonate formation [see e.g. JONES 4.1]. The copending claims also do not claim washing, a headbox, a press or dewatering screw, or the circulation of pressed water. SMOOK teaches that these are common features of pulp and paper

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mills. SMOOK discloses that the headbox is a critical part of the paper machine. At the time of the invention it would have been obvious to a person of ordinary skill to send the pulp of the copending claims to the headbox of SMOOK to make paper [see e.g. pg 228-230]. A headbox is present in virtually all paper machines and a person of ordinary skill in the art would be clearly motivated to have a headbox as to make paper and to spread a uniform amount of stock onto the forming fabric [see e.g. pg 228]. SMOOK discloses that pulp is stored in a high density storage chest before being turned into paper and that the storage chest holds the pulp at 12-15% consistency [see e.g. pg. 123]. SMOOK further discloses that a screw can be used to dewater the pulp [see e.g. pg. 123 figure 9-48]. At the time of the invention it would have been obvious to a person of ordinary skill in the art to have a dewatering screw downstream of the mixing device of the copending claims. A person of ordinary skill in the art would be clearly motivated to have such a dewatering screw to bring the low consistency treated stock (as low as 5%) to the storage consistency of 12-15% as storing pulp at the low consistency would adversely effect storage capacity. . Further a person would be motivated to have a storage container for the pulp as to allow for surges and capacity [see e.g. pg. 123]. A line to send water back from the dewatering screw is taught by SMOOK who states that washing systems operate in a counter current manner [pg. 100]. A person of ordinary skill in the art would be motivated to have such a line as to save water [pg. 248]. SMOOK discloses a dewatering screw for increasing the consistency of the pulp before it is stored in an HD tower (see e.g. pg 123 and figure 9-48]. Examiner notes that washing consists of displacement washing and diffusion washing. The increasing of the consistency of the pulp in the dewatering screw displaces less clean water. Therefore in the generally excepted meaning of washing the pulp and paper industry a dewatering screw does

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perform washing. Alternatively, SMOOK states that a washing unit can be used before the HD tank instead of a thickening device [see e.g. pg 123].

This is a provisional obviousness-type double patenting rejection.

Claims 23-47 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 7-53 of copending Application No.11/608029 as evidenced by *Calcium Carbonate agglomeration and form during precipitation from solution* by JONES et al., in view of Handbook for Pulp and Paper Technologists by SMOOK, hereinafter SMOOK. Although the conflicting claims are not identical, they are not patentably distinct from each other because are not identical, they are not patentably distinct from each other because the claims of both applications claim loading fibers with calcium carbonate by adding calcium hydroxide or calcium carbonate to the fiber suspension and then introducing carbon dioxide and refining the stock.

As for claim 23, the copending application claims a method for loading fibers with calcium carbonate by adding calcium oxide or calcium hydroxide in a dry or aqueous form (*A method for loading a fibrous suspension containing cellulose fibers with calcium carbonate, comprising: introducing one of aqueous calcium hydroxide, dry calcium hydroxide and calcium oxide into the fibrous suspension* [see e.g. claim 7]). The copending application further claims introducing carbon dioxide to precipitate out the calcium carbonate (*introducing gaseous carbon dioxide into the fibrous suspension; and precipitating the calcium carbonate in spherical agglomerations of crystals by the carbon dioxide* [see e.g. claim 7]).

As for claim 44, the copending application discloses an apparatus for loading fibers with calcium carbonate which includes a static mixer and a processing unit(*A device for loading a*

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fibrous suspension containing cellulose fibers with calcium carbonate, comprising: a reactor for performing a precipitation process, wherein the reactor is at least one of: a mixing device; a crystallizer reactor; a refiner; a disperger; and a fluffer FLPC reactor [see e.g. claim 52]).

Claim 52 of the copending application does not state what the processing unit is however the method claims of the copending application teach that the processing units include refiners, dispergers, and FLPC reactors [see e.g. claim 7 and claim 34].

The copending application claims do not claim spherical agglomerations are formed, however this is an inherent property of calcium carbonate formation [see e.g. JONES 4.1]. The copending claims also do not claim a headbox. SMOOK teaches that these are common features of pulp and paper mills. SMOOK discloses that the headbox is a critical part of the paper machine. At the time of the invention it would have been obvious to a person of ordinary skill to send the pulp of the copending claims to the headbox of SMOOK to make paper [see e.g. pg 228-230]. A headbox is present in virtually all paper machines and a person of ordinary skill in the art would be clearly motivated to have a headbox as to make paper and to spread a uniform amount of stock onto the forming fabric [see e.g. pg 228]. While the copending claims teach an intended use, this does not preclude the one-way obviousness over the instant application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

5. Claims 23-43 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 20-43 of copending Application No. 10/575541 as evidenced by *Calcium Carbonate agglomeration and form during precipitation from solution* by JONES et al., in view of Handbook for Pulp and Paper Technologists by

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SMOOK, hereinafter SMOOK. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of both applications claim loading fibers with calcium carbonate by adding calcium hydroxide or calcium carbonate to the fiber suspension and then introducing carbon dioxide and refining the stock.

As for claim 23, the copending application claims a method for loading fibers with calcium carbonate by adding calcium oxide or calcium hydroxide in a dry or aqueous form (*A method for loading a fibrous suspension containing cellulose fibers with calcium carbonate, comprising: introducing one of aqueous calcium hydroxide, dry calcium hydroxide and calcium oxide into the fibrous suspension* [see e.g. claim 20]). The copending application further claims introducing carbon dioxide to precipitate out the calcium carbonate (*introducing gaseous carbon dioxide into the fibrous suspension; and precipitating the calcium carbonate in spherical agglomerations of crystals by the carbon dioxide* [see e.g. claim 20]).

The copending application claims do not claim spherical agglomerations are formed, however this is an inherent property of calcium carbonate formation [see e.g. JONES 4.1]. Both sets of claims have the same process conditions. The copending claims also do not claim washing, a headbox, a press or dewatering screw, or the circulation of pressed water. SMOOK teaches that these are common features of pulp and paper mills. SMOOK discloses that the headbox is a critical part of the paper machine. At the time of the invention it would have been obvious to a person of ordinary skill to send the pulp of the copending claims to the headbox of SMOOK to make paper [see e.g. pg 228-230]. A headbox is present in virtually all paper machines and a person of ordinary skill in the art would be clearly motivated to have a headbox as to make paper and to spread a uniform amount of stock onto the forming fabric [see e.g. pg

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228]. SMOOK discloses that pulp is stored in a high density storage chest before being turned into paper and that the storage chest holds the pulp at 12-15% consistency [see e.g. pg. 123].

SMOOK further discloses that a screw can be used to dewater the pulp [see e.g. pg. 123 figure 9-48]. At the time of the invention it would have been obvious to a person of ordinary skill in the art to have a dewatering screw downstream of the mixing device of the copending claims. A person of ordinary skill in the art would be clearly motivated to have such a dewatering screw to bring the low consistency treated stock (as low as 5%) to the storage consistency of 12-15% as storing pulp at the low consistency would adversely effect storage capacity. Further a person would be motivated to have a storage container for the pulp as to allow for surges and capacity [see e.g. pg. 123]. A line to send water back from the dewatering screw is taught by SMOOK who states that washing systems operate in a counter current manner [pg. 100]. A person of ordinary skill in the art would be motivated to have such a line as to save water [pg. 248].

SMOOK discloses a dewatering screw for increasing the consistency of the pulp before it is stored in an HD tower (see e.g. pg 123 and figure 9-48]. Examiner notes that washing consists of displacement washing and diffusion washing. The increasing of the consistency of the pulp in the dewatering screw displaces less clean water. Therefore in the generally excepted meaning of washing the pulp and paper industry a dewatering screw does perform washing. Alternatively, SMOOK states that a washing unit can be used before the HD tank instead of a thickening device [see e.g. pg 123]. The copending claims do not explicitly disclose the apparatus of instant claim 44, however it does disclose all the process steps of related to the apparatus of claim 44 and the apparatus as described in the instant claim would be obvious to a person of ordinary skill in the art to use to complete said process. While the copending claims claim using flue gas as the

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source of CO₂ and removing the flue gas, this does not preclude the one-way obviousness over the instant application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

6. Claims 23-44 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 29-75 of copending Application No. 10/577511 as evidenced by *Calcium Carbonate agglomeration and form during precipitation from solution* by JONES et al., in view of U.S. Patent Publication 2003/0010463 DOELLE, hereinafter DOELLE. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of both applications claim loading fibers with calcium carbonate by adding calcium hydroxide or calcium carbonate to the fiber suspension and then introducing carbon dioxide.

As for claim 23, the copending application claims a method for loading fibers with calcium carbonate by adding calcium oxide or calcium hydroxide in a dry or aqueous form (*A method for loading a fibrous suspension containing cellulose fibers with calcium carbonate, comprising: introducing one of aqueous calcium hydroxide, dry calcium hydroxide and calcium oxide into the fibrous suspension* [see e.g. claim 29]). The copending application further claims introducing carbon dioxide to precipitate out the calcium carbonate (*introducing gaseous carbon dioxide into the fibrous suspension; and precipitating the calcium carbonate in spherical agglomerations of crystals by the carbon dioxide* [see e.g. claim 29]).

The copending application claims do not claim spherical agglomerations are formed, however this is an inherent property of calcium carbonate formation [see e.g. JONES 4.1]. The

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compending claims do not claim the temperature that the fiber loading process takes place at. DOELLE teaches a temperature of 20 to 90 degrees C [paragraph 0031]. At the time of the invention it would have been obvious to use the reaction temperatures of DOELLE in the claims of the compending application. Since the conditions of producing calcium carbonate in DOELLE were known in the art it would have been *prima facie* obvious to substitute the conditions of DOELLE for the process of the compending claims.

This is a provisional obviousness-type double patenting rejection.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claim 46 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 46 states that there is ‘another upstream device structured and arranged for preparing the fibrous suspension’. The examiner is unable to determine where this device is upstream of and thus unable to determine the meets and bounds of the patent protection desired by the applicant. For the purpose of examination, examiner has interpreted claim 46 as the ‘upstream device’ being upstream of the dewatering screw the same as the mixing device claimed in instant claim 45.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claim 23, 26, 27, 34, 35, 36, 37, 40, 41, 43, 44 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by U.S. Patent #5,223,090 KLUNGNESS et al., hereinafter KLUNGNESS et al. as evidenced by *Calcium Carbonate agglomeration and form during precipitation from solution* by JONES et al., hereinafter JONES et al.

As for claim 23, KLUNGNESS et al. discloses two methods for adding calcium carbonate to fibers such as chemical pulped fibers (*A method of loading a fibrous stock suspension containing chemical pulp fibers with calcium carbonate*). The first method takes place under low shear (low energy) mixing in a pressurized container and high consistencies [column 6 lines 64-68 and column 7 lines 1-5]. The second method takes place at lower consistencies and under high shear refining [column 7 lines 5-40].

KLUNGNESS et al. further teaches adding calcium oxide or calcium hydroxide with water to the fibers (*introducing one of aqueous calcium hydroxide, dry calcium hydroxide and calcium oxide into the fibrous suspension* [see e.g. column 6 lines 8-15]. Carbon dioxide is then added to the suspension of fibers which undergoes refining to precipitate out calcium carbonate. (*adding gaseous carbon dioxide into the fibrous stock suspension*. [see e.g. column 7 lines 5-42])). KLUNGNESS does not explicitly state the calcium carbonate forms spherical agglomeration. However, the spherical agglomerations of calcium carbonate will inherently form (*precipitating the calcium carbonate in spherical agglomerations of crystals by the carbon dioxide*) as evidenced by JONES et al. who states that spherical agglomerations form during the production of calcium carbonate [see e.g. 4.1 and Figure 1-3].

As for claim 26, KLUNGNESS et al. discloses that the pulp is refined during the precipitation step [see e.g. column 7 lines 5-42].

As for claim 27, KLUNGNESS et al. discloses refining the pulp at 10-70 watt-hrs/kg (10-70 kW-hrs/mt) which falls within the instant claimed range [column 7 lines 12-15].

As for claim 34, KLUNGNESS et al. discloses that the fiber suspension has a consistency of 5 to 15%, the non-fibrous component is water, therefore the fibrous suspension comprises an aqueous fibrous material [see e.g. column 7 lines 5-10].

As for claim 35, KLUNGNESS et al. discloses that the fiber suspension has a consistency of 5 to 15%, which falls within the instant claimed range [see e.g. column 7 lines 5 -10].

As for claim 36, KLUNGNESS et al. discloses that the pulp consistency is between 5 and 15% [column 7 lines 5-10]. KLUNGNESS et al. further discloses that the pulp is mixed with calcium oxide and water to the desired consistency [see e.g. column 6 lines 8-15]. Since the consistency of refining is 5-15% the desired consistency would be the same as the refining consistency. KLUNGNESS et al. further discloses that up to 50% by weight of cellulose of calcium hydroxide is added to the mixture. If the pulp slurry contains 5 grams pulp / 95 grams water and 50% calcium hydroxide is added than the total mixture by weight is 7.3%. If the pulp slurry contains 15 grams pulp and 85 grams water and 50% calcium hydroxide is added the mixture by weight would be ~21% solids by weight. Therefore the range of 7.3-21% solids of KLUNGNESS et al. anticipates the instant claimed range.

As for claim 37, KLUNGNESS et al. discloses that the calcium oxide/calcium hydroxide is mixed with the pulp [see e.g. column 6 lines 8-15]. KLUNGNESS et al. further discloses that

on the bench scale the mixing takes place in a Hobart Mixer which the examiner has interpreted as an intermediate vat and mixed at low speed which the examiner has interpreted as a static mixer [see e.g. column 8 lines 35-40].

As for claim 40, KLUNGNESS et al. discloses that dilution water is added with the calcium hydroxide/oxide to the pulp which occurs before the introduction of carbon dioxide [see e.g. column 6 lines 7-15].

As for claim 41, KLUNGNESS et al. discloses a refiner as the reactor in which precipitating occurs. KLUNGNESS et al. states that the consistency in the refiner is between 5-15% which falls within the instant claimed range [see e.g. column 7 lines 5-45].

As for claim 43, KLUNGNESS et al. discloses a refiner which has rotating plates and mixes the precipitated calcium carbonate [see e.g. column 7 lines 5-45].

As for claim 44, KLUNGNESS et al. discloses a mixing device [see e.g. column 8 lines 35 -40 and column 6 lines 7-15], a refiner [column 7 lines 5-45] and a high consistency reactor [column 6 lines 66-68 and column 7 lines 1-5].

Claim Rejections - 35 USC § 102/103

11. Claims 38 and 39 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over U.S. Patent #5,223,090 KLUNGNESS et al., hereinafter KLUNGNESS et al. as evidenced by *Calcium Carbonate agglomeration and form during precipitation from solution* by JONES et al., hereinafter JONES et al. and as evidenced by U.S. Patent 3,794,558 BACK, hereinafter BACK.

As for claims 38 and 39, KLUNGNESS et al. discloses the residence time of the high consistency process to be 1 to 60 minutes [see e.g. column 7 lines 1 -5]. KLUNGNESS et al. does not explicitly state the residence time of the 5-15% consistency carbonate loading process in the refiner. However, refiners have low residence times as there is only a small volume which the pulp passes through. A typical refiner would have a residence time less than 10 seconds with a time of 0.3 to 3 seconds being typical [see e.g. BACK column 5 lines 2-6] all times which fall within the instant claimed ranges. Alternatively a person of ordinary skill in the art would be motivated to optimize the time in the refiner to effect the amount of reaction and the amount of refining done by the refiner.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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14. Claims 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent #5,223,090 KLUNGNESS et al., hereinafter KLUNGNESS et al. *Calcium Carbonate agglomeration and form during precipitation from solution* by JONES et al., hereinafter JONES et al. in view of U.S. Patent Publication 2003/0010463 DOELLE, hereinafter DOELLE.

As for claim 24, KLUNGNESS et al. does not give guidance as to the temperature that the calcium oxide/hydroxide reaction with carbon dioxide should occur. DOELLE discloses that the carbon dioxide should be added preferably between 20 and 90 degrees C which overlaps with the instant claimed ranges [see e.g. paragraph 0031]. At the time of the invention it would have been obvious to a person of ordinary skill in the art to run the process of KLUNGNESS et al. at the temperatures of DOELLE. A person of ordinary skill in the art would be motivated to combine the art of KLUNGNESS et al. and DOELLE because DOELLE describes the temperatures given as preferable to running the calcium carbonate reaction [paragraph 0031]. Applying a known temperature range of DOELL to the known device of KLUNGNESS et al. to obtain the predictable results of calcium carbonate loading would have been *prima facie* obvious.

As for claim 25, DOELLE discloses that the calcium carbonate forms rhombohedral, scalenohedral, and spherical shapes [see e.g. paragraph 0035]. It is the examiners position, without evidence to the contrary that a person running the process of KLUNGNESS et al. using the conditions of DOELL, such as temperature and pH would also obtain crystals of the shape of DOELL. The crystals would inherently form spherical agglomerations as evidenced by JONES et al. who states that spherical agglomerations form during the production of calcium carbonate [see e.g. 4.1 and Figure 1-3].

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15. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent #5,223,090 KLUNGNESS et al., hereinafter KLUNGNESS et al. as evidenced by *Calcium Carbonate agglomeration and form during precipitation from solution* by JONES et al., in view of U.S. Patent Publication 2002/0092636 RHEIMS et al. and Handbook for Pulp and Paper Technologists by SMOOK, hereinafter SMOOK.

As for claim 42, KLUNGNESS teaches that for the high shear refiner the energy should be 10 – 70 kWh/ton [see e.g. column 7 lines 5-15]. KLUNGNESS does not teach the energy added in the low shear reactor. KLUNGNESS further does not teach a power input of the range 0.5 to 8 kWh/t. RHEIMS et al. teaches the overlapping range of 0.5 to 9 kWh/t. At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the energy range of 0.5 to 9 kWh/t. A person of ordinary skill in the art would be motivated to combine the art of KLUNGNESS et al. and RHEIMS because RHEIMS gives a known power input for the calcium carbonate reaction [paragraph 0031]. Applying a known power range of RHEIMS to the known device of KLUNGNESS et al. to obtain the predictable results of calcium carbonate loading would have been *prima facie* obvious. Furthermore, a person of ordinary skill in the art would be clearly motivated to adjust the range of power input as the power applied to fiber effects the properties (such as tear and tensile) of said fibers [see e.g. SMOOK pg 206]. Therefore a person of ordinary skill in the art would want to optimize the energy input to obtain the fiber qualities that are desired.

16. Claim 28, 29, 30, 31, 45, 46, and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent #5,223,090 KLUNGNESS et al., hereinafter KLUNGNESS et al. as evidenced by *Calcium Carbonate agglomeration and form during precipitation from solution*

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by JONES et al., in view of Handbook for Pulp and Paper Technologists by SMOOK, hereinafter SMOOK.

As for claim 28, KLUNGNESS does not disclose washing the pulp before the chemical loading process. KLUNGNESS et al. does disclose that the process can be uses with fibers prepared from chemical pulping [see e.g. column 5 lines 64-69]. SMOOK teaches that brownstock washing is a critical part of chemical pulping [see e.g. pg. 100]. At the time of the invention it would have been obvious to a person of ordinary skill in the art to wash the chemical pulp of KLUNGNESS before performing refining. A person of ordinary skill in the art would be clearly motivated to use brownstock washing to remove residual liquor and recover spent chemicals as disclosed in SMOOK [see e.g. pg 100].

As for claim 29, KLUNGNESS does not disclose a headbox vat downstream of the fiber loading process with calcium hydroxide and carbon dioxide. KLUNGNESS does make it clear that the calcium hydroxide and carbon dioxide are being added to the pulp to increase the filler in the paper made from the pulp [see e.g. column 1 lines 60-69]. SMOOK discloses that the headbox is a critical part of the paper machine. At the time of the invention it would have been obvious to a person of ordinary skill to send the pulp of KLUNGNESS et al. to the headbox of SMOOK to make paper [see e.g. pg 228-230]. A headbox is present in virtually all paper machines and a person of ordinary skill in the art would be clearly motivated to have a headbox as to make paper and to spread a uniform amount of stock onto the forming fabric [see e.g. pg 228].

As for claim 30, during the paper machine process of SMOOK the paper travels from the headbox to the paper wire and then to the press rolls where white water is squeezed out of the

pulp [see e.g. pg 247 and 248 and Figure 16-50 with press rolls]. Further SMOOK discloses that the white water is recovered and reuses, Figure 16-50 clearly shows whitewater from the press being reused for diluting the suspension in stock preparation and the headbox [see e.g. pg 247 and 248 and Figure 16-50]. At the time of the invention it would have been obvious to a person of ordinary skill in the art to make paper as taught in SMOOK by using the press arrangement to remove water from the pulp and recovering the whitewater. The presses and whitewater recovery system of SMOOK is used in virtually all paper machines and a person of ordinary skill in the art would be clearly motivated to recover the whitewater to decrease the amount of freshwater required [see e.g. pg. 248].

As for claim 31, KLUNGNESS et al. discloses adding calcium hydroxide/oxide with water to pulp and then mixing it [see e.g. column 6 lines 7-17]. The mixing and adding water of KLUNGNESS is the sloshing or diluting. The tank that the mixing occurs in is the holding tank. KLUNGNESS further shows this on the bench scale where the diluting takes place in a Hobart mixer [see e.g. column 8 lines 35-40].

As for claim 45, KLUNGNESS et al. discloses a mixer [see e.g. column 6 lines 8-15] and the refiner which also acts as a mixer [see e.g. column 7 lines 5-40]. KLUNGNESS et al. further discloses that the pulp enters the refiner at a consistency of 5-15%. KLUNGNESS et al. does not disclose a dewatering screw downstream of the mixing device. SMOOK discloses that pulp is stored in a high density storage chest before being turned into paper and that the storage chest holds the pulp at 12-15% consistency [see e.g. pg. 123]. SMOOK further discloses that a screw can be used to dewater the pulp [see e.g. pg. 123 figure 9-48]. At the time of the invention it would have been obvious to a person of ordinary skill in the art to have a dewatering screw

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downstream of the mixing device of KLUNGNESS et al. A person of ordinary skill in the art would be clearly motivated to have such a dewatering screw to bring the low consistency treated stock (as low as 5%) to the storage consistency of 12-15%. Storing pulp at the low consistency would adversely effect storage capacity.

As for claim 46, KLUNGNESS et al. discloses that the calcium oxide/hydroxide is mixed with the pulp [see e.g. column 6 lines 8-35] which the examiner has interpreted as a receiver vat. KLUNGNESS et al. discloses both the mixer and the refiner therefore there is one more upstream device for preparing the pulp than claim 45 requires [see e.g. column 6 lines 7-15 and column 7 lines 5-15]. KLUNGNESS et al. further discloses that the pulp enters the refiner at a consistency of 5-15%. KLUNGNESS et al. does not disclose a dewatering screw downstream of the mixing device, a storage container, or a line to feed back filtrate. SMOOK discloses that pulp is stored in a high density storage chest before being turned into paper and that the storage chest holds the pulp at 12-15% consistency [see e.g. pg. 123]. SMOOK further discloses that a screw can be used to dewater the pulp [see e.g. pg. 123 figure 9-48]. At the time of the invention it would have been obvious to a person of ordinary skill in the art to have a dewatering screw downstream of the mixing device of KLUNGNESS et al. A person of ordinary skill in the art would be clearly motivated to have such a dewatering screw to bring the low consistency treated stock (as low as 5%) to the storage consistency of 12-15%. Further a person would be motivated to have a storage container for the pulp as to allow for surges and capacity [see e.g. pg. 123]. Storing pulp at the low consistency would adversely effect storage capacity. A line to send water back from the dewatering screw is taught by SMOOK who states that washing systems operate

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in a counter current manner [pg. 100]. A person of ordinary skill in the art would be motivated to have such a line as to save water [pg. 248].

As for claim 47, KLUNGNESS et al. does not disclose a washing device for cleaning the fiber. SMOOK discloses a dewatering screw for increasing the consistency of the pulp before it is stored in an HD tower (see e.g. pg 123 and figure 9-48). Examiner notes that washing consists of displacement washing and diffusion washing. The increasing of the consistency of the pulp in the dewatering screw displaces less clean water. Therefore in the generally excepted meaning of washing the pulp and paper industry a dewatering screw does perform washing. Alternatively, SMOOK states that a washing unit can be used before the HD tank instead of a thickening device [see e.g. pg 123].

17. Claims 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent #5,223,090 KLUNGNESS et al., hereinafter KLUNGNESS et al. as evidenced by *Calcium Carbonate agglomeration and form during precipitation from solution* by JONES et al., in view of U.S. Patent Publication 2002/0092636 RHEIMS et al. and Handbook for Pulp and Paper Technologists by SMOOK, hereinafter SMOOK. as applied to claim 28, 29, 30, 45, 46, and 47 above, and further in view of U.S. Patent Publication 2003/0010463 DOELLE, hereinafter DOELLE.

As for claim 32 and 33, KLUNGNESS et al. does not give guidance as to the pH that the calcium oxide/hydroxide reaction with carbon dioxide should occur. However, calcium carbonate and calcium oxide are basic so an initial basic pH would be expected. DOELLE discloses that the pH should be 6 to 10 which overlaps is the instant claimed ranges of claims 32 and 33 [see e.g. paragraph 0031]. At the time of the invention it would have been obvious to a

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person of ordinary skill in the art to run the process of KLUNGNESS at the pH of DOELLE. A person of ordinary skill in the art would be motivated to combine the art of KLUNGNESS et al. and DOELLE because DOELLE describes the pH given as where to run the calcium carbonate reaction [paragraph 0031]. Applying a known pH range of DOELL to the known device of KLUNGNESS et al. to obtain the predictable results of calcium carbonate loading would have been *prima facie* obvious.

Conclusion

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY J. CALANDRA whose telephone number is (571)270-5124. The examiner can normally be reached on Monday through Friday, 7:30 AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Barbara Gilliam can be reached on (571) 272-1330. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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